INNOVATIONS IN NEXT GENERATION CB THREAT CHARACTERIZATION AND ASSESSMENT FOR DECISION SUPPORT

Multi-vehicle Mission Management For Autonomous Robotic Cbrn Response In Atak

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U.S. Forces have a technology gap in real-time capability to detect, locate, identify, and report on chemical/biological (CB) agents at distance on the battlefield. Current CB detection capabilities at distance are prohibitively expensive, difficult to maintain, and require advanced training to operate. The use of unmanned platforms for the detection of all states of matter using Unmanned Ground Vehicles (UGVs) and Unmanned Aerial Systems (UAS) represent future capabilities to enhance situational awareness enabling freedom of maneuver and action on a CB contested battlefield. Unmanned systems also provide standoff and safety in CB situations beyond detection and monitoring with such capabilities as mapping, remote decontamination, and hazard prediction.

Unmanned systems have the ability to keep the warfighter out of harm's way in a CBRN scenario, but to use them effectively requires coordination, collaboration, and control. Neya has developed the Mission Planning and Management System (MPMS), a vehicle-agnostic mission planning system providing an intelligent coordination between multiple manned and unmanned systems. This intelligent coordination allows easy assignment of even complex, multi-phase tasks, with the option of automated task assignment. MPMS can task any unmanned UxV assets (ground, air and maritime domains), manned assets, while providing live status reports of active missions.

As part of the MPMS ATAK integration effort, Neya Systems has created an interface within the Android Tactical Assault Kit (ATAK) ecosystem that is compatible with the MPMS network and user workflows. This interface can manage and task multiple unmanned systems to perform CBRN missions, such as plume survey, source locating, plume boundary mapping, and standoff surveillance. We have also integrated this application to send and receive information with existing ATAK CBRN plugins, such as CBRN Routing and Effects. This enables autonomous systems to be assigned intelligent routing for avoiding or surveying CBRN plumes using all available data. Users can record media from the autonomous vehicle livestream, which is then saved to a log at the end of the mission, along with the vehicle track and any plume data for after action reporting. Plumes and vehicle track are recorded as GeoTIFFs, enabling sending to any other TAK user regardless of whether the MPMS plugin is installed on their ATAK system. All of these capabilities are intended to provide control of multiple autonomous CBRN platforms, providing standoff detection and safety, while allowing the soldier to maintain situational awareness during mission execution.

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